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are evenly distributed over the area of the given circle, while in the numerator, of the published solution, they are represented by circumferences of circles that intersect oneanother, and therefore cannot be evenly distributed over the given circle; the terms, therefore, of the fraction which represents the required probability in the published solution, are non-homogeneous and hence do not necessarily represent the required result.

Instead of publishing Mr. Seitz's solution, as we promised in No. 1, we refer the reader to the solution of Problem 193 (Vol. V, p. 61), which can easily be modified so as to meet the requirements of this problem.—Ed.]

NOTE ON THE COMPUTATION OF π. By PROF. J. SCHEFFER.—Perhaps the most *convenient* way of calculating π may be derived from the development of $\sin^{-1}x \div \sqrt{(1-x^2)}$ into a series. Multiplying the well known series of $\sin^{-1}x$ and $1 \div \sqrt{(1-x^2)}$ together, the law of the formation of the coefficients of the ascending powers of x would not easily become apparent, but this difficulty will be obviated by the following method.

Putting $(\sin^{-1}x)^2 = Ax^2+Bx^4+Cx^6+Dx^8+Ex^{10}+\ldots$ (1)
and differentiating, we obtain:

$$2\sin^{-1}x\div\sqrt{(1-x^2)} = 2Ax+4Bx^3+6Cx^5+8Dx^7+10Ex^9+\ldots \quad (2)$$

Multiplying (2) by $\sqrt{(1-x^2)}$, and again differentiating,

$$2\div\sqrt{(1-x^2)} = (2A+3.4Bx^2+5.6Cx^4+7.8Dx^6+9.10Ex^8+\ldots)\sqrt{(1-x^2)}$$
$$-(2Ax+4Bx^3+6Cx^5+8Dx^7+10Ex^9+\ldots)x\div\sqrt{(1-x^2)}.$$

Multiplying this equation by the radical, and comparing the coefficients of the same powers of x, we find for the coefficients the following values:

$$A=1,\ B=\frac{2^2}{3.4},\ C=\frac{4^2}{5.6}B=\frac{2^2.4^2}{3.4.5.6};\ D=\frac{6^2}{7.8}C=\frac{2^2.4^2.6^2}{3.4\ldots8}, \text{ ete.}$$

We may present these coefficients in another form, viz.;

$$A=1,\ B=\frac{2}{3}\cdot\frac{1}{2},\ C=\frac{2.4}{3.5}\cdot\frac{1}{3},\ D=\frac{2.4.6}{3.5.7}\cdot\frac{1}{4},\ E=\frac{2.4.6.8}{3.5.7.9}\cdot\frac{1}{5}, \text{ etc.}$$

Substituting in (2) we get

$$\frac{\sin^{-1}x}{\sqrt{(1-x^2)}}=x+\frac{2}{3}x^3+\frac{2.4}{3.5}x^5+\frac{2.4.6}{3.5.7}x^7+\frac{2.4.6.8}{3.5.7\ 9}x^9+\ldots \quad (3)$$

Put $x=y\div\sqrt{(1+y^2)}$, then is $\sin^{-1}x=\sin^{-1}[y\div\sqrt{(1+y^2)}]$, and (3) becomes

$$\tan^{-1}y=\frac{y}{1+y^2}\left[1+\frac{2}{3}\left(\frac{y^2}{1+y^2}\right)+\frac{2.4}{3.5}\left(\frac{y^2}{1+y^2}\right)^2+\frac{2.4.6}{3.5.7}\left(\frac{y^2}{1+y^2}\right)^3+\ldots\right].$$

Since $\frac{1}{4}\pi=\tan^{-1}\frac{1}{2}+\tan^{-1}\frac{1}{3}$, we have

$$\frac{\pi}{4}=\frac{4}{10}\left[1+\frac{2}{3}\left(\frac{2}{10}\right)+\frac{2.4}{3.5}\left(\frac{2}{10}\right)^2+\frac{2.4.6}{3.5.7}\left(\frac{2}{10}\right)^3+\ldots\right]$$
$$+\frac{3}{10}\left[1+\frac{2}{3}\left(\frac{1}{10}\right)+\frac{2.4}{3.5}\left(\frac{1}{10}\right)^2+\frac{2.4.6}{3.5.7}\left(\frac{1}{10}\right)^3+\ldots\right].$$